2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons

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Multilateral approaches to the nuclear fuel cycle

Working paper submitted by Sweden

1. The concept of multilateral nuclear fuel assurances (MNA) has been on the international nuclear agenda for a long time, as part of the International Atomic Energy Agency (IAEA) discussions to improve the assurance of supply of low-enriched uranium (LEU) to States engaging in the peaceful uses of nuclear energy and, within the context of non-proliferation, as a means of limiting the unwarranted and uncontrolled spread of sensitive nuclear technologies (enrichment and reprocessing). The international commercial market for nuclear fuel services generally functions well, but there is perceived interest in adding a safety net by way of LEU reserves and, in the longer term, considering new joint undertakings to take care of an increasing demand. It is therefore an issue of considerable interest within the context of article IV of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT).

2. Against the backdrop of increased global interest in the development of nuclear energy in a situation of perceived looming energy scarcity, the MNA discussion has intensified, and a large number of more or less concrete proposals have been presented to implement the MNA concept, some for limited, immediate application, some more complex and long term. The details of the proposals, numbering at least 12, made so far can be found in the IAEA document GOV/INF/2007/11.

3. The MNA issue is of direct relevance to the statutory right of IAEA to assist member States in acquiring nuclear fuel for peaceful uses and to the implementation of relevant articles of the NPT, in particular article IV, on the right of every State party to develop a national fuel cycle in conformity with its safeguards obligations under the Treaty and relevant IAEA agreements. The fact that important national interests are perceived to be at stake has tended to make the debate on MNA somewhat complicated. However, a closer look at the factors involved seems to indicate that it should be possible to reconcile differences of view. As a matter of fact, while MNA may not suit the needs of all States, for the vast majority of States members of IAEA parties to the NPT, MNA arrangements could, in Sweden's view, be beneficial in adding to the generally desirable goals of increased supply assurance and non-proliferation.

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4. For the purposes of the current discussions on MNA, it seems desirable to make the following general observations. Existing proposals and ambitions are of very differing scopes and time horizons. The most concrete but also most limited, such as the Russian Angarsk project recently approved by the IAEA Board of Governors and the proposed IAEA LEU Bank, are small-scale, last resort backup mechanisms aimed at offsetting an unexpected, politically motivated loss of nuclear fuel supply from a customary commercial provider.

5. More ambitious projects which discuss the creation of new, additional, multilateral production facilities, even the total multilateralization or internationalization of all enrichment (and possibly reprocessing), are obviously a much more complex undertaking which presupposes a new sense of trust between nuclear suppliers and recipients and new cooperative, commercial forms of peaceful nuclear cooperation.

6. While these more ambitious goals certainly remain desirable and should be further pursued, it seems advisable, for the present, to concentrate on the more immediate implementation of the Angarsk project and a possible decision on the IAEA LEU Bank concepts, deriving from them some generally applicable principles which might also be useful in the context of later developments. For the purpose of the present NPT discussions on article IV of the Treaty in particular, some of the following points should be kept in mind (cf. also IAEA secretariat information note 2010/1):

7. It has been unequivocally and repeatedly confirmed that such backup mechanisms would not require a State to give up its national rights regarding any parts of the nuclear fuel cycle. The use of the reserve mechanisms would be apolitical and non-discriminatory and based on previously agreed eligibility criteria to be applied independently by the Director General of IAEA. It would be available to all States that are in compliance with their safeguards obligations. It would also be market neutral.

8. Recourse to the backup mechanism would be entirely voluntary, for any State to use or not to use in an emergency. Indeed, States engaging in the peaceful use of nuclear energy would, as a rule, have contracted an assured long-term supply of LEU and nuclear fuel on the international commercial market. It is only in the event of the failure of this supply, for some political reason unconnected with proliferation concerns, that the backup mechanism would become operative as a limited last resort. In the most likely and ideal case, the LEU reserve would only rarely need to be used. Even so, the very existence of such a safety net, administered and, in the case of the IAEA LEU Bank, owned by IAEA, can be seen as a useful unilateral offer of technical cooperation, financed wholly or in large part by contributing States and at no or very limited additional cost to the potential user (besides the cost of the fuel itself) or to IAEA.

9. In spite of manifold assurances that the various MNA schemes will not affect national rights to develop the various parts of the fuel cycle, this concern still seems to be prevalent. However, from a practical point of view the situation presents itself very differently for the vast majority of States engaging in or planning to engage in the peaceful use of nuclear energy, mainly for electricity production. Any country embarking on a complex and costly nuclear energy production programme, which for the power-producing reactors alone would run into tens of billions of dollars, will carefully consider the extra industrial, technological, environmental and other costs, including perhaps political, for developing related parts of the fuel cycle such

as enrichment. This is true both for industrialized and newly industrializing States. The case of Sweden might serve as an illuminating example.

10. Sweden is a highly industrialized State with advanced technological know-how, including in the nuclear field. It depends on nuclear energy for about 45 per cent of its electricity needs. This is produced in 10 reactors, some Swedish built (our per capita use of nuclear energy is among the highest in Europe and in the world). When embarking on nuclear power in the 1960s, Sweden had ambitious plans and the technical capacity to master and utilize the whole nuclear fuel cycle from uranium milling to reprocessing. But for a number of reasons, including economies of scale, industrial and market demands as well as environmental and political considerations, such plans were gradually abandoned in favour of utilizing a reliable international market for nuclear fuel services and, in the case of spent fuel, important national final storage schemes.

11. The Swedish example shows that even in the case of a fairly large national nuclear programme, reliance on a well-functioning international market has proved more advantageous than initiating costly and uncertain national schemes of doubtful value. A number of other countries, in Europe and elsewhere, have come to the same conclusion, which will in all likelihood also hold true for new countries considering the nuclear road (cf. also the submission by the Republic of Korea in document NPT/CONF.2010/PC.III/WP.29, para. 6). As a matter of fact, out of the 12 countries in the world having the highest share of electricity produced in nuclear reactors, only one, France, also engages in uranium enrichment activities. None of them has experienced problems with the timely supply of LEU from the commercial market. Generally, disruptions in the market, for any reason, have been rare. None of these States has given up, or will give up, its formal rights under article IV of the NPT. As such States have as a rule concluded long-term international agreements to satisfy their needs for nuclear services, it is to be expected that they would rarely have to apply for help from an emergency LEU storage facility. Nevertheless, it is Sweden's conviction that the availability of such facilities would be a useful, albeit limited, instrument to ensure supply to a State where an unforeseen need for LEU has arisen.

12. Critics of the LEU storage schemes have voiced doubts as to whether any such mechanism can ever be totally reliable and whether there will not always be a danger of exerting political influence on the Director General of IAEA in his supposedly independent decision to release the LEU to a requesting State in conformity with pre-established criteria. The IAEA secretariat has offered valuable suggestions on how to overcome this perceived problem.

13. It has been pointed out as a weakness of the LEU reserve proposals (Angarsk and the IAEA Fuel Bank) that they do not provide assurances in regard to the individual fuel fabrication needs of requesting States. In this respect, Sweden shares the view of the IAEA secretariat that this additional supply aspect could be resolved in a second stage and should not be considered as an obstacle to agreement on the basic LEU reserve arrangement.

14. The two LEU reserve mechanisms do not involve any transfer of technology and are therefore simple and non-prejudicial to any future multilateral, new production facilities, which may well have to find innovative ways of handling the relevant "sensitive" technology aspects (cf. the suggestions made by Germany in its proposal on the Multilateral Enrichment Sanctuary Project (MESP) — International Atomic Energy Agency, INFCIRC/735.

15. The vast majority of small and medium-sized nuclear power States ("reactor States") would see advantages in relying on a well-functioning commercial market to supply LEU and other services, backed up by the extra security of reserve capacity, as discussed above. However, a very few large non-nuclear-weapon States with important nuclear power generating programmes, perhaps counting several tens of reactors, might well have a rationale for developing a full national fuel cycle. There is little reason to believe that this would not be considered legitimate, as long as it were done in accordance with international obligations and standards relating to safety, security and non-proliferation.

16. Such States and groups of States might also wish to cooperate in the construction of new production facilities, when and if additional capacity seems necessary. In due course this may lead to an increased interest in the more advanced types of MNA installations discussed in some proposals. Such new production arrangements would, fundamentally, be based on the same rules and values as the limited LEU storage concepts. They would equally be voluntary, they would not infringe on the formal rights of States under article IV of the NPT and they could make industrial, economic and environmental sense. IAEA could, and should, play a role as administrator and supervisor to ensure that the plant operates in accordance with agreed safety, security and non-proliferation standards, thus adding to the international credibility of the undertaking. Although it will in all likelihood still be some time until such new capacity is called for, it is desirable to prepare the ground for such new common endeavours, which by sharing ownership and management of installations could go a long way towards defusing the present distrust between suppliers and recipient States. The so-called MESP proposal presented by Germany already provides a number of valuable suggestions to build on for such common efforts.

17. It would also be desirable to pay attention to joint multilateral schemes in relation to the back-end of the fuel cycle, i.e., reprocessing of spent fuel and/or final storage of spent fuel, including from other States. Final storage is a difficult proposition considering public opinion in most countries, but it is possible that in large supplier States and in certain regional contexts such cooperative schemes for intermediate and perhaps final storage could be achievable.

18. As can be seen, MNA arrangements, whether in their more rudimentary form of a backup reserve or in a more developed future form of new enrichment (and, possibly, reprocessing) capacity, can play a very useful role for various categories of States. They will not negatively affect anybody's rights or interests. In the NPT context, there would be at least two desirable consequences: MNA will make a contribution to enhanced security of supply, which will increase the stability and confidence of States embarking on the peaceful nuclear road; at the same time, such arrangements will have positive non-proliferation and confidence-building effects in regard to important parts of the nuclear fuel cycle.

19. All of this would seem to be in the general interest of all States parties to the NPT, whether they wish to be directly involved with MNA projects or not. Positive agreement on the potential benefits of MNA could be one important contribution of the NPT Review Conference within the scope of article IV.

20. The 2010 NPT Review Conference should, therefore, take note of the important work that has been carried out in the IAEA on MNA and encourage States parties to make further efforts in this area.